

AMENDMENTS TO THE CLAIMS

The listing of claims presented below will replace all prior versions and listings of claims in the application.

Listing of claims:

1 – 21. (canceled)

22. **(currently amended)** A digital multimedia broadcasting system, comprising:

an audio/video encoding means for encoding inputted audio/video signals;

a systems encoding means for objectifying data for an interactive service and synchronizing a media stream which is outputted from **each of the audio/video** encoding means, a media stream of additional data, and a media stream which is generated by objectifying the data for the interactive service;

a multiplexing means for multiplexing **each of the** media streams outputted from the **system systems** encoding means;

an error correction encoding means for performing additional error correction encoding onto a media stream outputted from the multiplexing means;

an interleaving means for removing temporal correlation between adjacent byte units within a media stream outputted from the error correction encoding means; and

a first transmitting means for transmitting a digital multimedia broadcasting media stream outputted from the interleaving means,

wherein ~~the first transmitting means is any one~~ **each** of a digital audio broadcasting system, a digital television (TV) broadcasting system, a digital satellite broadcasting system, ~~or and~~ a digital cable broadcasting system **are configured to be the first transmitting means.**

23. (previously presented) The system as recited in Claim 22, wherein the audio/video signals are obtained by converting multimedia source data into data stream of a predetermined format through a preprocessing.

24. (**currently amended**) The system as recited in Claim 22, wherein the audio/video encoding means converts the inputted video signal into a format of 'Moving Picture Experts Group (MPEG)-4 Part 2' or a format of 'MPEG-4 Part 10', which is Advanced Video Coding (AVC).

25. (**currently amended**) The system as recited in Claim 22, wherein the audio/video encoding means converts the inputted audio signal into one of formats of 'Advanced Audio Coding (AAC)', 'Advanced Audio Coding Plus (AAC+)', and 'Bit Sliced Arithmetic Coding (BSAC)'.

26. (previously presented) The system as recited in Claim 22, wherein the systems encoding means includes:

an Object Descriptor (OD)/Binary Format for Scene (BIFS) generating means for generating OD/BIFS for the interactive service;

an Initial Object Descriptor (IOD) generating means for generating an IOD; and

a sync layer packetizing means for synchronizing media streams outputted from the encoding means and the OD/BIFS generating means.

27. (previously presented) The system as recited in Claim 26, wherein the multiplexing means includes:

a PES packetizing means for generating a Program Elementary Stream (PES) packet based on a packet which is generated in the sync layer packetizing means based on the media stream outputted from the encoding means;

a section packetizing means for generating sections based on a data which is outputted from the IOD generating means and a packet which is generated in the sync layer packetizing means based on a OD/BIFS stream, wherein the OD/BIFS stream is outputted from the OD/BIFS generating means; and

a transport stream (TS) packetizing means for packetizing data outputted from the PES packetizing means and the section packetizing means into transport stream.

28. (previously presented) The system as recited in Claim 27, wherein the section packetizing means includes:

a 14496 section packetizing means for generating 14496 section based on the packet which is generated in the sync layer packetizing means based on the OD/BIFS stream; and

a Program Service Information (PSI) generating means for generating PSI based on the data outputted from the IOD generating means.

29. (previously presented) The system as recited in Claim 22, wherein the error correction encoding means is a Reed-Solomon (RS) encoder.

30. (previously presented) The system as recited in Claim 22, wherein the interleaving means is composed of 12 branches and the branches individually include a plurality of memories having a 17bytes x N unit where $N=0, 1, 2, \dots, 11$, and input/output switches operating in synchronization with each other; sync words are transmitted always through a '0' branch for synchronization; and synchronization of a deinterleaver is acquired by allocating a first recognized sync word to the '0' branch of the deinterleaver.

31. (previously presented) The system as recited in Claim 22, further comprising an Ensemble Transport Interface (ETI) converting means for converting the digital multimedia broadcasting media stream outputted from the interleaving means into an ETI frame and delivering the ETI frame to the transmitting means.

32. (previously presented) The system as recited in Claim 22, further comprising an Internet Protocol (IP) datagram converting means for converting the digital multimedia broadcasting media stream outputted from the interleaving means into an IP datagram and delivering the IP datagram to the transmitting means.

33. **(currently amended)** A digital multimedia broadcasting system, comprising:
a first receiving means for receiving digital multimedia broadcasting media stream **having a bit error rate (BER) of less than 1×10^{-8}** ,
a deinterleaving means for deinterleaving the received digital multimedia broadcasting media stream which is interleaved to remove temporal correlation in

adjacent byte units;

an error correction decoding means for performing additional error correction decoding onto the deinterleaved digital multimedia broadcasting media stream which is generated from additional error correction encoding;

a demultiplexing means for demultiplexing the additional error correction decoded digital multimedia broadcasting media stream which is multiplexed;

a systems decoding means for decoding the demultiplexed digital multimedia broadcasting media stream to produce each of media stream, additional data, and data objectified for an interactive service; and

an audio/video decoding means for decoding the media stream into audio/video signals,

wherein ~~the first receiving means is any one~~ each of a digital audio broadcasting system, a digital television (TV) broadcasting system, a digital satellite broadcasting system, ~~or and~~ a digital cable broadcasting system are configured to be the first receiving means.

34. (currently amended) The system as recited in Claim 33, wherein the audio/video decoding means decodes a video signal included in the media stream based on 'Moving Picture Experts Group (MPEG)-4 Part 2' or 'MPEG-4 Part 10' which is Advanced Video Coding (AVC).

35. (currently amended) The system as recited in Claim 33, wherein the audio/video decoding means decodes an audio signal included in the media stream

based on one of 'Advanced Audio Coding (AAC)', 'Advanced Audio Coding Plus (AAC+)', and 'Bit Sliced Arithmetic Coding (BSAC)'.

36. (previously presented) The system as recited in Claim 33, wherein the error correction decoding means is a Reed-Solomon (RS) decoder.

37. (currently amended) A digital multimedia broadcasting method, comprising the steps of:

- a) encoding inputted audio/video signals inputted into a first receiving device;
- b) objectifying data for an interactive service and synchronizing a media stream which is outputted from the step a), comprising each of a media stream of additional data, and a media stream which is generated by objectifying the data for the interactive service;
- c) multiplexing the media streams outputted from the step b);
- d) performing additional error correction encoding onto a media stream outputted from the step c);
- e) performing interleaving to remove temporal correlation between adjacent byte units within a media stream outputted from the step d); and
- f) transmitting a digital multimedia broadcasting media stream outputted from the step e),

wherein ~~the step f) is performed by using any one~~ each of a digital audio broadcasting system, a digital television (TV) broadcasting system, a digital satellite broadcasting system, or and a digital cable broadcasting system are configured to be

the transmitted digital multimedia broadcasting media stream outputted from the step e).

38. (previously presented) The method as recited in Claim 37, wherein the audio/video signals are obtained by converting multimedia source data into data stream of a predetermined format through a preprocessing.

39. (previously presented) The method as recited in Claim 37, wherein the step a) converts the inputted video signal into a format of 'Moving Picture Experts Group (MPEG)-4 Part 2' or a format of 'MPEG-4 Part 10', which is Advanced Video Coding (AVC).

40. (previously presented) The method as recited in Claim 37, wherein the step a) converts the inputted audio signal into one of formats of 'Advanced Audio Coding (AAC)', 'Advanced Audio Coding Plus (AAC+)', and 'Bit Sliced Arithmetic Coding (BSAC)'.

41. (previously presented) The method as recited in Claim 37, wherein the step b) includes the steps of:

b1) generating an Object Descriptor (OD)/ Binary Format for Scene (BIFS) for the interactive service;

b2) generating an Initial Object Descriptor (IOD); and

b3) performing a sync layer packetization to synchronize media streams

outputted from the step a) and the step b1).

42. (previously presented) The method as recited in Claim 41, wherein the step c) includes the steps of:

c1) generating a Program Elementary Stream (PES) packet based on a packet which is generated in the step b3) based on the media stream outputted from the step a);

c2) generating sections based on a data which is outputted from the step b2) and a packet which is generated in the step b3) based on a OD/BIFS stream, wherein the OD/BIFS stream is outputted from the step b1); and

c3) packetizing data outputted from the step c1) and the step c2) into transport stream.

43. (previously presented) The method as recited in Claim 42, wherein the step c2) includes the steps of:

c21) generating 14496 section based on the packet which is generated in the step b3) based on the OD/BIFS stream; and

c22) generating PSI based on the data outputted from the step b2).

44. (previously presented) The method as recited in Claim 37, wherein the step d) is performed in a Reed-Solomon (RS) encoder.

45. (previously presented) The method as recited in Claim 37, wherein the step e) is

performed in an interleaving means which is composed of 12 branches and the branches individually include a plurality of memories having a 17bytes x N unit where $N=0, 1, 2, \dots, 11$, and input/output switches operating in synchronization with each other; sync words are transmitted always through a '0' branch for synchronization; and synchronization of a deinterleaver is acquired by allocating a first recognized sync word to the '0' branch of the deinterleaver.

46. (previously presented) The method as recited in Claim 37, further comprising the step of:

g) converting the digital multimedia broadcasting media stream outputted from the step e) into an ETI frame and delivering the ETI frame to the step f).

47. (previously presented) The method as recited in Claim 37, further comprising the step of:

h) converting the digital multimedia broadcasting media stream outputted from the step e) into an IP datagram and delivering the IP datagram to the step f).

48. (**currently amended**) A digital multimedia broadcasting method, comprising the steps of:

a) receiving digital multimedia broadcasting media stream inputted into a first receiving device;

b) deinterleaving the received digital multimedia broadcasting media stream which is interleaved to remove temporal correlation in adjacent byte units;

c) performing additional error correction decoding onto the deinterleaved digital multimedia broadcasting media stream which is generated from additional error correction encoding;

d) demultiplexing the additional error correction decoded digital multimedia broadcasting media stream which is multiplexed;

e) decoding the demultiplexed digital multimedia broadcasting media stream to produce **each of** media stream, additional data, and data objectified for an interactive service; and

f) decoding the media stream into audio/video signals,

wherein **the step a) is performed by using any one each** of a digital audio broadcasting system, a digital television (TV) broadcasting system, a digital satellite broadcasting system, **or and** a digital cable broadcasting system **are configured to be the received digital multimedia broadcasting media stream inputted into the first receiving device.**

49. (previously presented) The method as recited in Claim 48, wherein the step f) decodes the video signal included in the media stream based on 'Moving Picture Experts Group (MPEG)-4 Part 2' or 'MPEG-4 Part 10' which is Advanced Video Coding (AVC).

50. (previously presented) The method as recited in Claim 48, wherein the step f) decodes the audio signal included in the media stream based on one of 'Advanced Audio Coding (AAC)', 'Advanced Audio Coding Plus (AAC+)', and 'Bit Sliced Arithmetic

Coding (BSAC)'.

51. (previously presented) The method as recited in Claim 48, wherein the step c) is performed in a Reed-Solomon (RS) decoder.